Minimally Invasive Dentistry: Enhancing oral health related behaviour through behaviour change techniques

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The practice of Minimally Invasive Dentistry requires a paradigm shift in thinking about the delivery of oral healthcare from a largely restorative treatment philosophy to one in which while restorative treatment has its place, it is part of a continuum of care which starts with prevention of caries (1). Patients have a key role to play in maintaining their own oral health (2). The behaviours which are central to oral health are summarized in box 1.

Box 1 about here

Theoretical Background

The current dominant psychological approach to the understanding of health behaviour comprises the COM-B model and its associated taxonomy of behaviour change techniques (3). The COM-B model postulates that behaviour change requires three different components. These are:

i) *capability* **(C)** i.e. the person having the *physical* (e.g. strength) and *psychological* (e.g. knowledge, skills to perform the behaviour

ii) *opportunity* **(O)**, i.e. the *physical* (e.g. access) and *social environment* (e.g. exposure to ideas) are such that the person feels able to undertake the new behaviour

iii) *motivation* **(M)** refers to the person's *conscious* (e.g. planning and decision making) and *automatic* (e.g. innate drives, emotional reactions, habits) processes said to underline the emission of any behaviour.

It is suggested that before any change can take place, the above conditions all need to be met by addressing each individual area. That is the individual patient must have the capability to perform the behaviour, be motivated to do so, and create or have created for them the opportunity to engage in the behaviour.

In order to achieve change in Capability, Opportunity and Motivation, a range of behaviour change techniques have been identified (BCT). This has led to developments such as the Behaviour Change Wheel (4), the first version of the Behaviour Change Technique Taxonomy (5) and the Theoretical Domains Framework (6)

The Behaviour Change Wheel (Figure 1) is a method for designing interventions aimed to support people in behaviour change. It consists of an identification of i) Sources of behaviour as per the COM-B model, ii) Intervention Functions (e.g. education, persuasion, training, coercions, modelling etc) and finally iii) a policy component that places (i) and (ii) within a wider societal system involving processes such as service provision, legislation etc.

Figure 1 about here

Putting theory into action

Based upon the COM-B model and the associated behaviour change wheel, we identify four steps in the process of encouraging patients to change their oral health related behaviour (see Figure 2), each step building on the previous one. Each step will be addressed in turn.

Figure 2 about here

Creating Capability: Provision of information and guidance

Giving your patients the information on what behaviours are important to improve and maintain their oral health can appear deceptively simple. Typically, the dental care team will explain the findings of their various clinical examinations and the importance of taking particular steps – often supported by written materials. However, once your patient has received the information it is important that they remember it. There is evidence that patients do not recall as much advice and agreed actions about future dental care as dentists believe they have discussed (7). There are several practical tips to improve patients' memory for healthcare advice which concern not the content of the message but the manner in which it is delivered (8).

- Tell the patient the important points first. It has been shown that by using what is known as the 'primacy effect' practitioners can increase recall of health information by up to 36%.
- Emphasise to the patient that information which is most important (this may increase recall by 13%).
- Making the message more understandable. There are several dental terms and phrases that are taken for granted in dentistry but which may not be understood by

patients. Consider the best form of words to make the message understandable and identify simple ways of explaining jargon terms. Aside from jargon, the words and sentence structures used by the dental team may be more or less understandable. Short sentences and short words are easier to understand. Avoid long sentences with multiple clauses. Other ways in which sentences can be made more understandable are to use personal statements; for example, 'I believe ...' 'I think ...', and to avoid the passive voice. Using these techniques can improve recall by 13%.

- Categorise the information in an explicit manner to help the patient recall. Techniques that can be used include complex forms of categorisation; for example, spider diagrams or other diagrammatic summaries. Alternatively, you could provide patients with mnemonic devices such as acronyms to help them recall particular points. Even simple categorisation can help to improve recall. For example, 'There are three points for you to remember ...'.
- Repeat important information.
- Use specific statements rather than general statements. Making your message specific can improve recall of the message by up to 35%. For example, 'I would like you to keep your teeth cleaner' is general; it provides the patient with only limited information about how you want them to change their behaviour. State more explicitly what the patient can do. For example, 'I would like you to do two things to help keep your mouth cleaner. First, I want you to brush your teeth twice a day using the technique I showed you. Clean them for about 2 minutes each time. Try cleaning each section, bottom right, bottom left and so on for about 30 seconds each. Second, I would like you to floss the gaps between your teeth twice a week, say once on Sunday and once on Wednesday.'
- Send reminders. Telephone and mail reminders for appointments may improve attendance by up to 17%. A phone call to let the patient know that you are expecting him the next day can reduce unexpected non-attendance and so decrease lost time and opportunity costs.

Information on techniques and skills, such as toothbrushing technique or flossing, could be provided through on line videos, using such information to reinforce and supplement the information given in the practice. Encourage patients to use such resources to minimize the

time spent in the busy practice. Such information can be individualized to a degree by recommending specific videos or information sources for particular patients, emphasising the key areas that each individual patient should focus on. Time is short in dental practice and it may be the case that practitioners find they have limited opportunity for the more intensive methods outlined above, for example spider diagrams, however these may have relevance for individuals involved in more intensive one to one health education.

Enhancing Motivation: Identifying those cognitions likely to increase behaviour

'Motivation' refers to the person's *conscious* and *automatic* processes said to underline the behaviour (3). Conscious processes include decision making and planning the behaviour, whereas automatic processes include innate drives, emotional reactions and habits that drive our behaviour. For many people toothbrushing is an automatic behaviour which they undertake at a certain time (which is much the same every day and is related to the habitual pattern of their day) whereas flossing may involve more active planning. Later we will discuss the importance of shifting many oral hygiene behaviours from conscious processes into a more habitual pattern of behaviour.

There are many thoughts, attitudes and beliefs which have been explored in relation to oral health behaviours in numerous studies often as part of theoretical models of behaviour change. A recent systematic review of interventions to enhance oral health related behaviours found that two particular cognitions were important in predicting the likelihood of patients changing their behaviour (9), these were:

- Emphasising the benefits of behaviour change
- Providing information on the patients' susceptibility to disease.

Emphasising the benefits of behaviour change. A common approach to motivating patients is to emphasise the harm of not changing behaviour, however such fear inducing messages may be counterproductive in that they induce a negative response in the patient (10), the evidence suggests that positive messages identifying the benefits of change are more effective particularly when given in the context of how the patient can achieve those benefits (11). Ideally the benefits identified should be those that are valued by the patient, try asking the patient what is important to them about their teeth and mouth, and

emphasise how they can fulfil those desires through working with you and your team. It is often useful to remind patients that the majority of the care of their teeth is in their own hands – they after all look after their teeth every day.

Providing information on the patients' susceptibility to disease. Identifying the patients susceptibility provides an individualised personal motivation for change. There are several ways of providing such information, and some computerised records system will provide written and visual presentations of the level of risk for a patient. It is important to emphasise that through changing behaviour such susceptibility can be mitigated, that susceptibility does not inevitably mean that the patient will experience disease, but rather that they should take special care to mitigate the risk through engaging in healthy behaviours.

Creating Opportunity: putting motivation into action

Motivation alone is not sufficient to create behaviour change. There is a gap between the desire to engage in a behaviour and transforming that motivation into action. Specific strategies can help with this. As part of a systematic review, we have identified an approach to enhancing volition which we call GPS (see Box 2).

Box 2 about here

Goal setting: The goals set will relate to the overall aim of treatment to improve oral health through changing behaviour. The goals set should be SMART: Specific, Measurable, Achievable, Realistic and Timed. Rather than simply suggesting that an individual floss regularly set a target, that they floss a specific number of times per week. Goals can be cumulative in order to create steps towards the ultimate goal. For example flossing twice a week initially, then three times a week, until gradually the target of daily flossing is achieved. The broad aims of behaviour change have been outlined in Box 1, the role of goal setting at this level is to identify the steps along the way to achieving those aims.

Planning: Encourage patients to make a specific plan of where, when and how the particular behaviour should occur. For example, the individual might specify "flossing" as the

behaviour and a suitable situation as “in the bathroom in the evening after brushing my teeth every night”. Alternatively, the patient could be encouraged to associate flossing with a commonly occurring behaviour, for example “floss after you have washed you hair”.

A review of 63 studies adopting the planning approach to a variety of behaviours found that making a plan of when, where and how to engage in a behaviour makes a significant difference to the likelihood that the behaviour change will occur (12). A smaller number of studies have applied this approach to oral hygiene-related behaviour. Schutz et al (13) found that planning was the only significant predictor of adherence to a daily regime of flossing in 157 university dental students. Sniehotta et al (14) developed a brief intervention to planning in a group of university students. By asking participants to plan where and when they would floss their teeth, Sniehotta and colleagues were able to demonstrate an improvement in the proportion of participants who were flossing three times a week or more. Two studies have explored the impact of planning interventions in patients with periodontal disease – both found that self-reported oral hygiene was improved in patients who were given the brief (typically lasting 1 minute) planning intervention both in specialist secondary care and general dental practice (11,15).

Self-Monitoring. Monitoring how well patients are achieving the goals they set provides feedback on performance which can allow the patient to adjust their plans if necessary. Since feedback is most effective if delivered in a timely fashion, encouraging the patient to adopt systems to record and reflect on their own behaviour can be effective. Suresh et al (16) found that keeping a flossing diary can increase dental flossing and reduce plaque and bleeding scores in patients with periodontal disease, in the short term. Techniques for monitoring can be simple pencil and paper records to more sophisticated telephone apps that both remind individuals about their goal and record behaviours (see for example the following APPs available for smart phones, Strides; Remente; TraxItAll).

Long term change: Forming a habit

Unless behaviour change occurs in the long term, its impact on oral health is unlikely to be sustained. Ultimately we would hope that the oral health behaviours which we seek to

encourage in patients become incorporated into their daily routines, that is they become habitual. For those behaviours such as toothbrushing and flossing etc it is likely that the greater the repetition of the behaviour, the more likely it is that the behaviour becomes habitual. The new behaviour gradually comes to replace the previous behaviour. Regular self-monitoring may assist in this process (17). In addition, our behaviour is often driven by environmental cues, for example we eat at certain times of day, use reminders and diaries for certain key tasks etc. As oral health behaviours become more habitual the presence of such cues (for example their floss packet in the bathroom, a bottle of mouthwash) will help to cue the patient.

Overview for the practitioner

1. Provide information on the behaviour to be addressed in a structured manner emphasising the importance of the information and using explicit strategies to aid recall of the information.
2. Tell the patient their individual susceptibility to the caries process, together with the benefits of changing their behaviour.
3. Set a SMART goal for the patient to achieve between this visit and their next.
4. Plan when, where and how they will try the new behaviour
5. Encourage the patient to record how well they do. How often do they manage to achieve their goal.
6. Encourage persistence. The longer the patient continues the more likely it is that they will form a habit. For infrequent behaviours (such as attending the practice) encourage the patient to link the visit to other significant events that they will recall (eg birthdays, holidays etc).

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Box 1: Key oral health behaviours

- Regular daily tooth-brushing with a fluoride containing toothpaste.
- Increased exposure to fluoride, including regular use of mouthwash.
- Interdental cleaning.
- Reduction in the frequency of sugar containing foodstuffs, particularly sugar containing snacks between meals.
- Regular attendance at the dentist (at least once every two years or more often on the basis of their risk of developing oral disease).
- Refrain from tobacco use or quit tobacco use if the individual currently uses tobacco products.

Box 2: Enhancing Volition

G - goal setting (i.e., identifying with the patient the change to be made)

P - planning (i.e., working with the patient to decide when, where and how they will undertake the behaviour change)

S - self-monitoring (i.e., encouraging the patient to assess their own behaviour in relation to the goals)

Figure 1: The process of encouraging behaviour change